

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An apparatus for recovering a carrier, comprising:
a signal converter outputting baseband I, Q signals by multiplying digitized passband I, Q signals by a complex carrier according to a phase error;
first and second filters removing data components of the baseband I, Q signals;
a divider dividing a signal outputted from the second filter by a signal outputted from the first filter;
a multiplier multiplying a signal outputted from the divider by the baseband I signal delayed for a predetermined time period; and
an oscillator generating ~~a~~the complex carrier according to a signal outputted from the multiplier.

2. (Original) The apparatus of claim 1, wherein the divider divides a pilot component of the baseband Q signal by a pilot component of the baseband I signal.

3. (Original) The apparatus of claim 1, further comprising a gain multiplier multiplying the signal outputted from the divider by a gain according to the delayed baseband I signal.

4. (Currently Amended) The apparatus of claim 1, further comprising:
a delay delaying the signal outputted from the first filter for ~~a~~the predetermined time period; and

a sign extractor extracting a sign of the signal outputted from the delay, and providing the extracted sign to the multiplier.

5. (Currently Amended) A method for recovering a carrier, comprising:

- (a) converting digitized passband I, Q signals to baseband I, Q signals;
- (b) removing data components from the baseband I, Q signals;
- (c) dividing the baseband Q signal having the data component removed therefrom by the baseband I signal having the data component removed therefrom;
- (d) delaying the baseband I signal having the data component removed therefrom for a predetermined time period, and multiplying the delayed baseband I signal by the division result; and
- (e) generating a complex carrier according to the multiplication result.

6. (Currently Amended) The method of claim 5, further comprising ~~(f) a step of~~ multiplying the division result by a constant gain according to the delayed baseband I signal, after delaying the baseband I signal.

7. (Currently Amended) An apparatus for recovering a carrier, comprising:

- a signal converter outputting baseband I, Q signals by multiplying digitized passband I, Q signals by a complex carrier according to a phase error;
- first and second filters transmitting pilot components of the baseband I, Q signals;

a divider dividing the pilot component of the baseband Q signal by the pilot component of the baseband I signal;

a delay delaying the pilot component of the baseband I signal for a predetermined time period;

a gain multiplier multiplying a signal outputted from the divider by a constant gain according to a signal outputted from the delay;

a multiplier multiplying a signal outputted from the gain multiplier by the signal outputted from the delay; and

an oscillator generating a the complex carrier according to a signal outputted from the multiplier.

8. (Original) The apparatus of claim 7, further comprising a sign extractor extracting a sign from the pilot component of the baseband I signal outputted from the delay, and providing the extracted sign to the multiplier.

9. (Currently Amended) A method for recovering a carrier, comprising:

(a) outputting baseband I, Q signals by multiplying digitized passband I, Q signals by a complex carrier according to a phase error;

(b) filtering the baseband I, Q signals to transmit pilot components thereof;

(c) dividing the pilot component of the baseband Q signal by the pilot component of the baseband I signal;

(d) delaying the pilot component of the baseband I signal for a predetermined time period, and multiplying the division result by a constant gain according to the pilot component of the delayed baseband I signal; and

(e) generating ~~a~~the complex carrier according to the multiplication result.

10. (Currently Amended) The method of claim 9, further comprising:
extracting a sign from the pilot component of the delayed baseband I signal;
calculating ~~a~~the phase error by multiplying the multiplication result by the extracted sign; and
generating ~~a~~the complex carrier proportional to the phase error.

11. (New) An apparatus for recovering a carrier, comprising:
a signal converter to output baseband I and Q signals based on a complex carrier;
at least one filter to remove data components of the baseband I and Q signals and to output filtered baseband I and Q signals;
a divider to divide the filtered baseband Q signal by the filtered baseband I signal;
a first multiplier to multiply a signal outputted from the divider by the filtered baseband I signal delayed for a predetermined time period; and
an oscillator to generate the complex carrier according to a signal outputted from the first multiplier and to supply the complex carrier to the signal converter.

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12. (New) The apparatus of claim 11, further comprising: a second multiplier disposed between the divider and the first multiplier.